UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/501,349	07/15/2004	Takayuki Watanabe	04208.0204	7885

22852 7590 07/10/2006

FINNEGAN, HENDERSON, FARABOW, GARRETT & DUNNER LLP
901 NEW YORK AVENUE, NW
WASHINGTON, DC 20001-4413

EXAMINER	
GOODWIN, DAVID J	

ART UNIT	PAPER NUMBER
2818	

DATE MAILED: 07/10/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/501,349	WATANABE ET AL.	
	Examiner	Art Unit	
	David Goodwin	2818	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *24 May 2006*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-30* is/are pending in the application.

4a) Of the above claim(s) *18-30* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-17* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *11/16/04 03/10/06*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Election/Restrictions

1. Applicant's election without traverse of claims 1 through 17 in the reply filed on May 24, 2006 is acknowledged.

Claim Objections

2. Claims 8 through 11 are objected to because of the following informalities: Claim 8 recites the limitation "the contact surface" in line 9. There is insufficient antecedent basis for this limitation.

3. Claims 9 through 11 are objected to as depending from and incorporating claim 8.

4. Appropriate correction is required.

Claim Rejections - 35 USC § 102

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

6. Claims 1 through 7 and 12 through 17 are rejected under 35 U.S.C. 102(b) as being anticipated by Shibasaki (US 5,453,727).

7. Regarding claim 1.

8. Shibasaki teaches a semiconductor device. Said device comprises a stacked structure (fig 2). Said stack is formed on a substrate (1). Said stack comprises a first compound semiconductor layer (2). Said stack comprises an active sensor layer (7). Said stack comprises a second compound semiconductor layer (6) (column 4 lines 5-25). Said first and second compound semiconductor layers comprise AlGaSb, GaAsSb, AlAsSb, or AlInAsSb (column 5 lines 30-40). Said active sensor layer comprises Indium.x. Galium.1-x. Arsinic.y. Antimony.1-y., wherein x is in the range of 0.8-1.0 and y is in the range of 0.8-1.0 (column 4 lines 35-50). Said first (2) and second (6) compound semiconductor layers have a band gap that greater then the active sensor layer (7) (column 5 lines 40). Said first (2) and second (6) compound semiconductor layer shave a resistance that is more than 5 times greater than the active sensor layer (7) (column 5 lines 20-30). The first semiconductor layer has a lattice constant that is the same as the sensor layer (column 3 lines 45-50). The second semiconductor layer has a lattice constant that is the same as the sensor layer (column 3 lines 1-10). Said first and semiconductor layers have a lattice constant that is within 2 percent of the active sensor layer (column 5 lines 50-55). Said active sensor layer is less than 0.1 micrometers (column 4 lines 45-50).

9. Regarding claim 2.

10. The compound semiconductor stack comprises a third compound semiconductor layer stacked on said second semiconductor layer (6) (column 6 lines 1-10). Said third compound semiconductor layer comprises GaAs (column 5 lines 30-40).

11. Regarding claim 3.

12. Said active sensor layer comprises indium.x. galium.1-x. arsinic.y. antimony.1-y., wherein x is in the range of 0.8-1.0 and y is in the range of 0.8-1.0 (column 4 lines 35-50). Where x=1 and Y=1 the active sensor layer will consist of indium arsenide.

13. Regarding claim 4.

14. Said first and second compound semiconductor layer comprise Aluminum.a. Gallium.1-a. arsenic.c. antimony.1-c. wherein a is in the range of 0.0-1.0 and c is preferably in the range of 0.0-0.4 (column 5 lines 30-45).

15. Regarding claim 5.

16. The stacked structure comprises a magnetic sensor (column 2 lines 55-65). The stack further comprises electrodes layer (4) (fig 2) (column 1 lines 10-20).

17. Regarding claim 6

18. The stack comprises a device that is very small, on the order of micrometers (column 5 lines 60-65) and therefore is very mobile.

19. Regarding claim 7

20. The use of the device in a phone comprises functional language.

21. The limitation must distinguish from the prior art in terms of structure rather than function, *In re Schreiber*, 128 F.3d 1473, 1477-78, 44 USPQ2d 1429, 1431-32 (Fed. Cir. 1997); See also *In re Swinehart*, 439 F.2d210, 212-13, 169 USPQ 226, 228-29 (CCPA 1971). Claims directed to apparatus must be distinguished from the prior art in terms of structure rather than function. *In re Danly*, 263 F. 2d 844, 847, 120 USPQ 528, 531 (CCPA 1959). "Apparatus claims cover what a device is, not what a device does."

Hewlett-Packard Co. v. Bausch & Lomb Inc., 909 F. 2d 1464, 1469, 15 USPQ2d 1525, 1528 (Fed. Cir. 1990).

22. Regarding claim 12.

23. Said device uses the Hall effect (column 4 lines 5-15). Said device comprises an active sensor layer comprises Indium.x. Galium.1-x. Arsinic.y. Antimony.1-y., wherein x is in the range of 0.8-1.0 and y is in the range of 0.8-1.0 (column 4 lines 35-50). Said first (2) and second (6) compound semiconductor layers have a band gap that greater then the active sensor layer (7) (column 5 lines 40). The stack further comprises electrodes layer (4) (fig 2) (column 1 lines 10-20). Said electrodes comprise a metal layer (column 6 lines 40-55). Said device further comprises passivation (column 4 lines 15-25). Said device comprises first (2) and second (6) compound semiconductor layers (column 4 lines 5-20) layers. Said layers may comprise of GaAs (column 5 lines 30-40).

24. Regarding claim 13.

25. Said device is a magneto sensitive pattern and uses the Hall effect (column 4 lines 5-15). Said device comprises an active sensor layer having Indium.x. Galium.1-x. Arsinic.y. Antimony.1-y., wherein x is in the range of 0.8-1.0 and y is in the range of 0.8-1.0 (column 4 lines 35-50). Said active sensor layer is less than 0.1 micrometers (column 4 lines 45-50). Said active sensor is sandwiched between a first (2) and a second (6) compound semiconductor layers (column 4 lines 5-20).

26. The resistance sensitivity under applied voltage and magnetic fields and conditions is inherent to the materials and structure used. As the claimed structure is the same the resistance sensitivity will be the same.

27. Further, response to voltage and magnetic fields is functional language.

28. The limitation must distinguish from the prior art in terms of structure rather than function, *In re Schreiber*, 128 F.3d 1473, 1477-78, 44 USPQ2d 1429, 1431-32 (Fed. Cir. 1997); See also *In re Swinehart*, 439 F.2d210, 212-13, 169 USPQ 226, 228-29 (CCPA 1971). Claims directed to apparatus must be distinguished from the prior art in terms of structure rather than function. *In re Danly*, 263 F. 2d 844, 847, 120 USPQ 528, 531 (CCPA 1959). "Apparatus claims cover what a device is, not what a device does." *Hewlett-Packard Co. v. Bausch & Lomb Inc.*, 909 F. 2d 1464, 1469, 15 USPQ2d 1525, 1528 (Fed. Cir. 1990).

29. Regarding claim 14.

30. Said active sensor layer (7) is sandwiched between lower (2) and upper (6) layers (fig 2) (column 4 lines 5-20). Said first and second compound semiconductor layers comprise AlGaSb, GaAsSb, AlAsSb, or AlInAsSb (column 5 lines 30-40).

31. Regarding claim 15.

32. Using the said device as a pointing device is functional language.

33. The limitation must distinguish from the prior art in terms of structure rather than function, *In re Schreiber*, 128 F.3d 1473, 1477-78, 44 USPQ2d 1429, 1431-32 (Fed. Cir. 1997); See also *In re Swinehart*, 439 F.2d210, 212-13, 169 USPQ 226, 228-29 (CCPA 1971). Claims directed to apparatus must be distinguished from the prior art in terms of structure rather than function. *In re Danly*, 263 F. 2d 844, 847, 120 USPQ 528, 531 (CCPA 1959). "Apparatus claims cover what a device is, not what a device does."

Hewlett-Packard Co. v. Bausch & Lomb Inc., 909 F. 2d 1464, 1469, 15 USPQ2d 1525, 1528 (Fed. Cir. 1990).

34. Regarding claim 16.

35. Using the said device as an open/close detection switch is functional language.

36. The limitation must distinguish from the prior art in terms of structure rather than function, *In re Schreiber*, 128 F.3d 1473, 1477-78, 44 USPQ2d 1429, 1431-32 (Fed. Cir. 1997); See also *In re Swinehart*, 439 F.2d210, 212-13, 169 USPQ 226, 228-29 (CCPA 1971). Claims directed to apparatus must be distinguished from the prior art in terms of structure rather than function. *In re Danly*, 263 F. 2d 844, 847, 120 USPQ 528, 531 (CCPA 1959). "Apparatus claims cover what a device is, not what a device does." *Hewlett-Packard Co. v. Bausch & Lomb Inc.,* 909 F. 2d 1464, 1469, 15 USPQ2d 1525, 1528 (Fed. Cir. 1990).

37. Regarding claim 17.

38. Using the said device as a geomagnetic direction sensor is functional language.

39. The limitation must distinguish from the prior art in terms of structure rather than function, *In re Schreiber*, 128 F.3d 1473, 1477-78, 44 USPQ2d 1429, 1431-32 (Fed. Cir. 1997); See also *In re Swinehart*, 439 F.2d210, 212-13, 169 USPQ 226, 228-29 (CCPA 1971). Claims directed to apparatus must be distinguished from the prior art in terms of structure rather than function. *In re Danly*, 263 F. 2d 844, 847, 120 USPQ 528, 531 (CCPA 1959). "Apparatus claims cover what a device is, not what a device does." *Hewlett-Packard Co. v. Bausch & Lomb Inc.,* 909 F. 2d 1464, 1469, 15 USPQ2d 1525, 1528 (Fed. Cir. 1990).

Claim Rejections - 35 USC § 103

40. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

41. Claims 8 through 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shibasaki (US 5,453,727) in view of Partin (US 5,883,564).

42. Regarding claim 8.

43. Shibaski teaches a device is that uses the Hall effect (column 4 lines 5-15). Said device comprises a stack comprising an active sensor layer (7). Said stack comprises a first compound semiconductor layer (2). Said stack comprises a second compound semiconductor layer (6) (column 4 lines 5-25). Said first and second compound semiconductor layers comprise AlGaSb, GaAsSb, AlAsSb, or AlInAsSb (column 5 lines 30-40). Said active sensor layer comprises Indium.x. Galium.1-x. Arsinic.y. Antimony.1-y., wherein x is in the range of 0.8-1.0 and y is in the range of 0.8-1.0 (column 4 lines 35-50). The stack further comprises electrodes (4) (fig 2) (column 1 lines 10-20). Said electrode layer (4) comprise metal (column 6 lines 40-50).

44. Shibaski further teaches that it is preferable that the electrodes are formed directly on the active sensor layer and that an intermediate

45. Shibaski does not teach that the electrode only contacts the active layer.

46. Partin teaches a device wherein the electrodes (16) are deposited and patterned such that they only contact the active layer (10).

47. It would have been obvious to one ordinary skill in the art to deposit and pattern the electrodes such that they are only on the active layer in order to prevent stray current from flowing through the non-active layers.

48. Regarding claim 9.

49. Said first and second compound semiconductor layers comprise AlGaSb, GaAsSb, AlAsSb, or AlInAsSb (column 5 lines 30-40).

50. Regarding claim 10.

51. The compound semiconductor stack comprises a third compound semiconductor layer stacked on said second semiconductor layer (6) (column 6 lines 1-10). Said third compound semiconductor layer comprises GaAs (column 5 lines 30-40).

52. Regarding claim 11.

53. The substrate (1) comprises GaAs or Si (column 6 lines 60-67). The active layer comprises InAs (column 4 lines 35-50). Said first and second compound semiconductor layer comprise Aluminum.a. Gallium.1-a. arsenic.c. antimony.1-c. wherein a is in the range of 0.0-1.0 and c is preferably in the range of 0.0-0.4 (column 5 lines 30-45).

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to David Goodwin whose telephone number is (571)272-8451. The examiner can normally be reached on Monday through Friday, 9:00am through 5:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Matthew Smith can be reached on (571)272-1907. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

DJG

MATTHEW SMITH
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2800